

GROUNDWATER MANAGEMENT

Ideas for mainstreaming groundwater

Groundwater, a critical resource that South Africans often treat as 'out of sight, out of mind,' has gained widespread attention following recent extreme droughts such as the one experienced in Cape Town. However, the precious time and resources invested in groundwater drought relief projects over the last few months will become meaningless, unless a concerted effort is made to use the data generated for future planning purposes. This is according to a working paper authored by Yazeed van Wyk and Eunice Ubombo-Jaswa of the Water Research Commission.



South Africa needs to incorporate lessons learnt and develop better mechanisms that will allow for the proper management and use of groundwater systems in their sustainability plans. A case in point is the drought the City of Cape Town has been experiencing over the past few years. Notwithstanding the importance record low rainfall events had on triggering the water crises, the severity of the drought could have been alleviated by good governance.

The Eastern Cape has also been affected by the drought with

the Coega Development Corporation (CDC) increasing its water conservation efforts in a bid to tackle the water crisis as it reached dire straits in the Nelson Mandela Bay Metro. A number of artesian boreholes were drilled in the CDC area, and will be used as part of the future water supply of the town.

Regulatory context

The National Water Resource Strategy 2 (NWRS 2) incorporates groundwater in a meaningful way, enabled by the National Groundwater Strategy. South Africa has some of the best

legislation, policies, regulations, guidelines and strategies at its disposal. However, efficient management of groundwater relies on the effectiveness of applicable legislation and institutional arrangements, as well as good understanding of the behaviour of an aquifer or wellfield being managed.

There is generally a lack of skilled technicians and other operation and management specialists, particularly in small towns needed to make informed decisions at the local wellfield scale. A recent research study conducted by researchers at the University of the Free State's Institute for Groundwater Studies (IGS) showed that all municipalities rated groundwater as a critical resource, yet there is little planning nor capacity available to do the actual work.

Recent reforms within government have placed the responsibility for the coordination of education, training and skills development across sectors in the Department of Higher Education through the various Sector Education and Training Authorities (SETAs). The SETAs should therefore be seen as the main drivers that can address the skills gap by funding relevant workplace based training and mentoring strategies.

Groundwater governance is a critical issue requiring worldwide attention. Groundwater management often lacks the financial and human capacity needed for the investigation of the resource characteristics and functions, especially in developing countries and, as a consequence, there are shortcomings in terms of reasonable legal provisions and pricing systems. The dynamic nature of both socio-economic development and predictions of global climate change makes groundwater management

complex, uncertain and often unpredictable.

The invisible nature and complexity of aquifers has meant that groundwater resources do not easily lend themselves to inform policy for the necessary building of resilience. This suggests that groundwater can only gain a role as a strategic resource where an integrated approach to urban water management and governance acknowledges the importance of all available resources and moves away from the focus on large infrastructure and centralised water supply solutions.

The future management of our water resources requires that decisions concerning resource allocation and use are made transparent through informed public participation and by fully considering ecosystem requirements, inter-generational equity and precautionary principles.

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Managed aquifer recharge

When considering issues of changing climate and rising intensity of climate extremes, managed aquifer recharge (MAR) can become an increasingly important water management

Ashraf Hendricks/GroundUp



Drilling for groundwater during the height of the Cape Town drought.



Groundwater plays a crucial role in especially rural water supply.

strategy, alongside demand management, to maintain, enhance and secure stressed groundwater systems and to protect and improve water quality. MAR or artificial recharge of groundwater is the intentional storage of water underground to reduce evaporative losses and utilize the porous aquifer media for water conservation and decontamination

MAR has been practiced in South Africa since the mid-1970s at the Atlantis aquifer, however, much more work is needed to document the costs and benefits of MAR. This will include doing work in relation to alternative water supplies or places of storage and in identifying scenarios where MAR is likely to produce the least-cost water supply and greatest benefit accounting for all objectives.

Groundwater quality

Knowledge of groundwater's chemical and microbial quality is critical when attempting to predict its use. In general, little is known about the microbial quality of groundwater, especially in the case of privately owned wells or boreholes in rural areas.

Groundwater might not be suitable for drinking and other uses without prior treatment in these areas. In urban areas microbial groundwater quality is increasingly compromised due to rapid expansion of informal settlements and inadequate waste management practices from various anthropogenic activities that result in the contamination of groundwater.

In South Africa, saline groundwater resources are not well

understood, but could present significant sources of water for both industrial and mining applications. Saline groundwater is often termed a nuisance, however, given the current drought situation this water could potentially become an important source to the water supply-mix in the future coupled with desalination or other emerging water treatment technologies.

In conclusion, there appears to be plenty of opportunities for groundwater to be considered a mainstream resource if managed in a holistic manner. This article recognises the strategic role of groundwater resources for the effective management and mitigation during periods of drought.

Fundamental to its application is generating a sense of urgency in order to rally the political will to secure effective groundwater governance at all levels. Hydrogeologists, and other professionals involved in groundwater, are a key component in creating such a sense of urgency by raising public awareness in terms of opportunities and threats.

The appropriate appraisal of groundwater resources, with which diverse stakeholders can identify, should be considered as a vital precursor to its sustainable management. Last but not least, good policy design alone is insufficient for effective groundwater governance. Rather, implementation requires sufficient investments, reliable science, accurate data, good leadership, and equitable decision-making.